FIG. 1

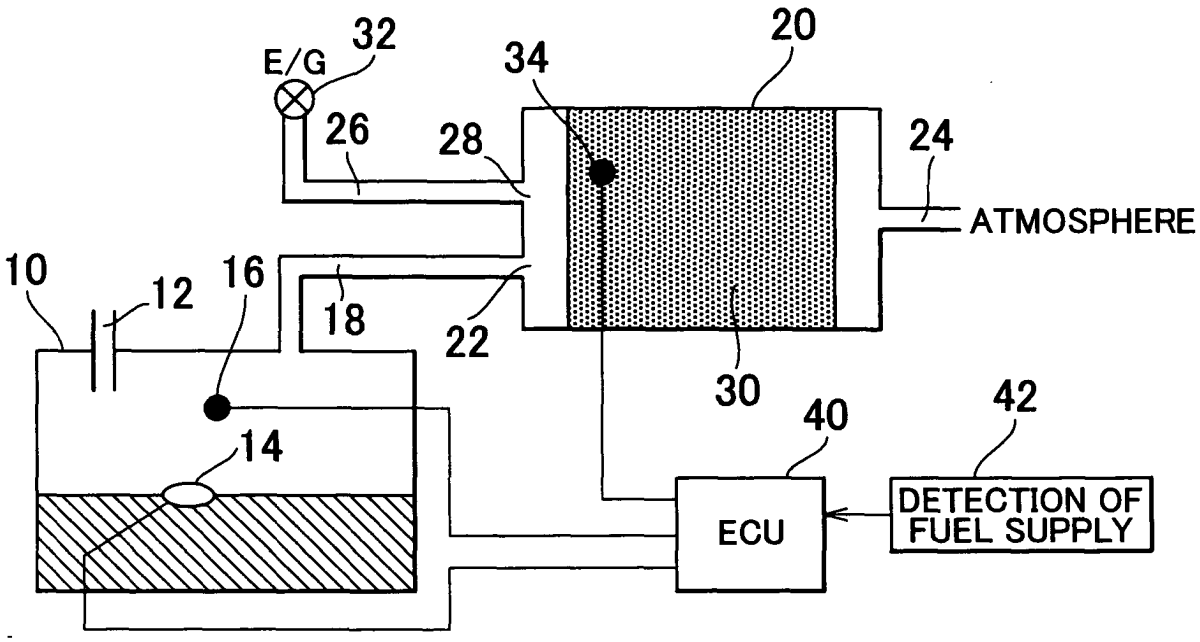

E/G
32
34
20
26
28
24
ATMOSPHERE
10
12
16
18
22
30
14
40
42
ECU
DETECTION OF FUEL SUPPLY

FIG. 2

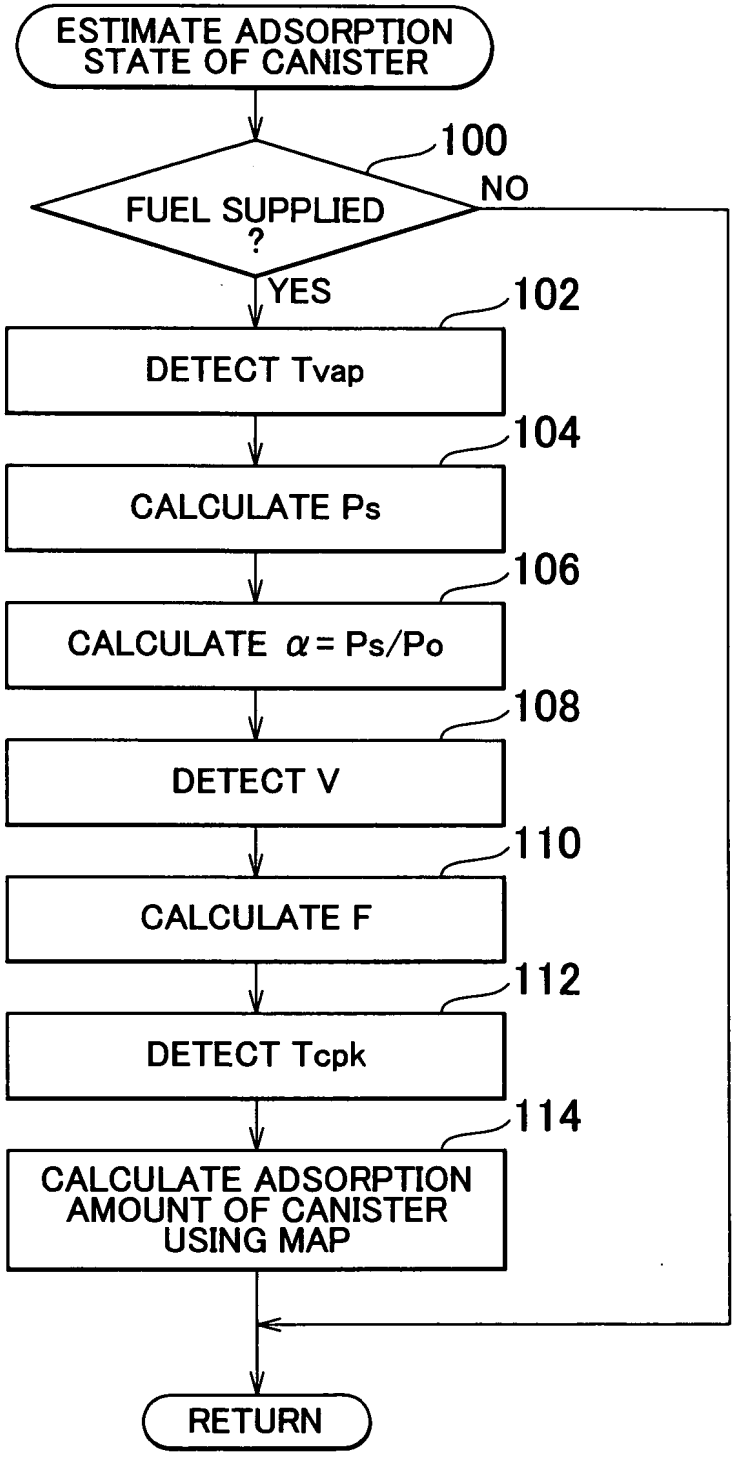

ESTIMATE ADSORPTION STATE OF CANISTER
100
FUEL SUPPLIED ?
NO
YES
102
DETECT Tvap
104
CALCULATE Ps
106
CALCULATE α = Ps/Po
108
DETECT V
110
CALCULATE F
112
DETECT Tcpk
114
CALCULATE ADSORPTION AMOUNT OF CANISTER USING MAP
RETURN

FIG. 3

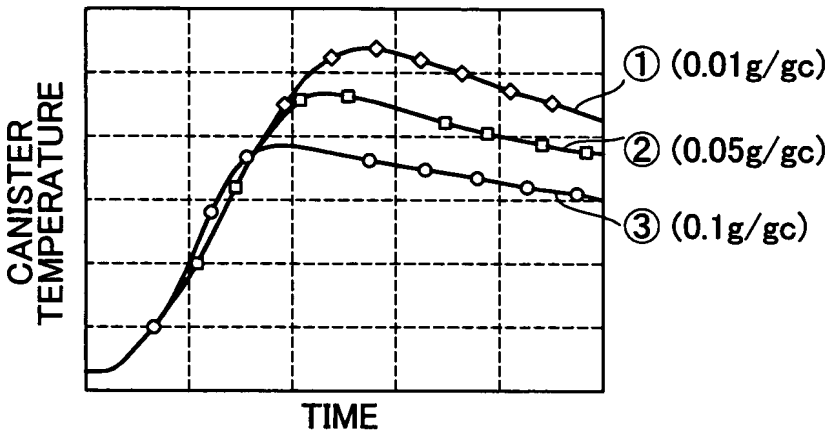


FIG. 4

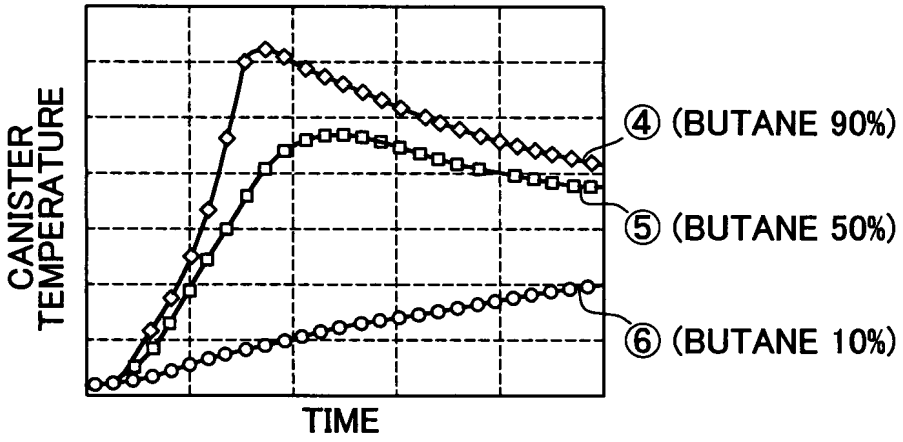


FIG. 5

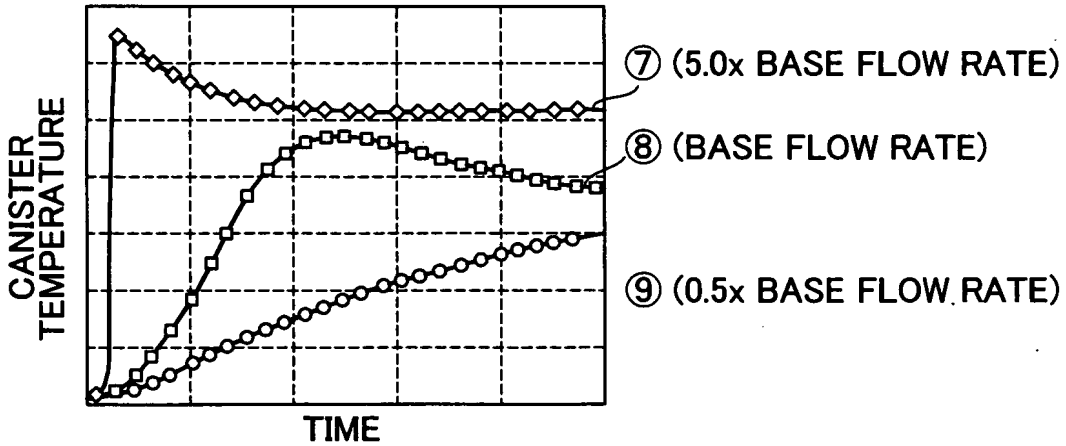


FIG. 6

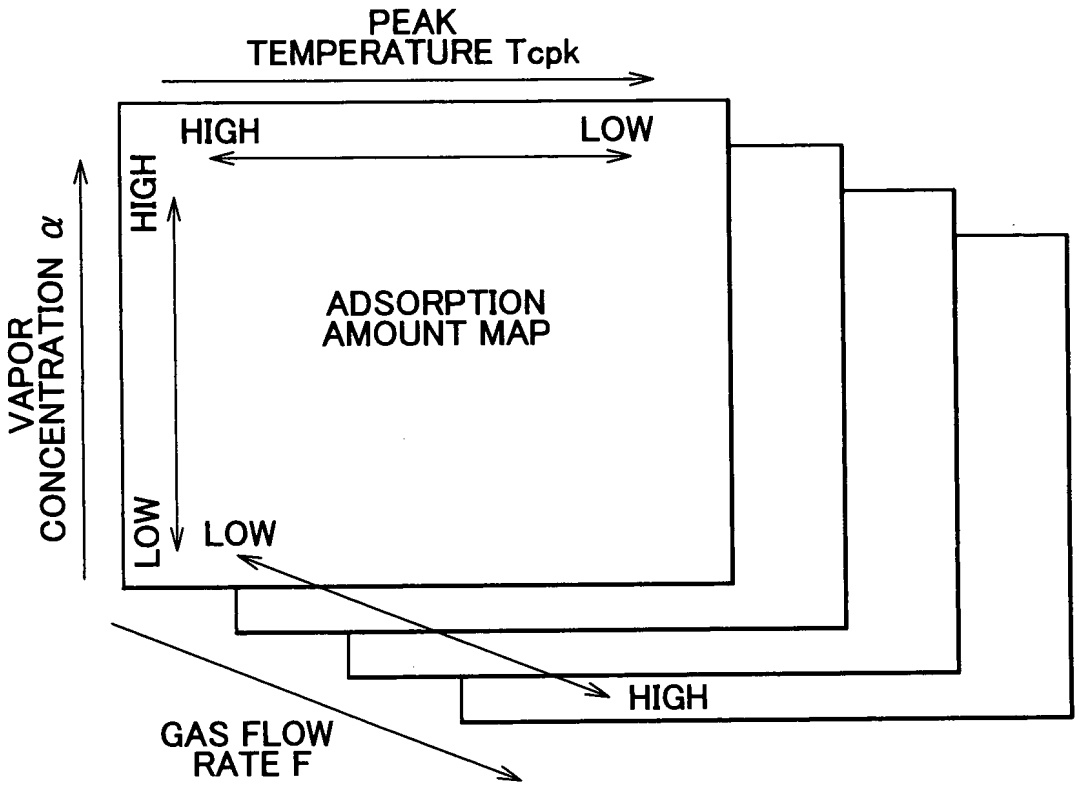

PEAK
TEMPERATURE Tcpk
HIGH
LOW
HIGH
VAPOR
CONCENTRATION α
ADSORPTION
AMOUNT MAP
LOW
LOW
HIGH
GAS FLOW
RATE F

FIG. 7

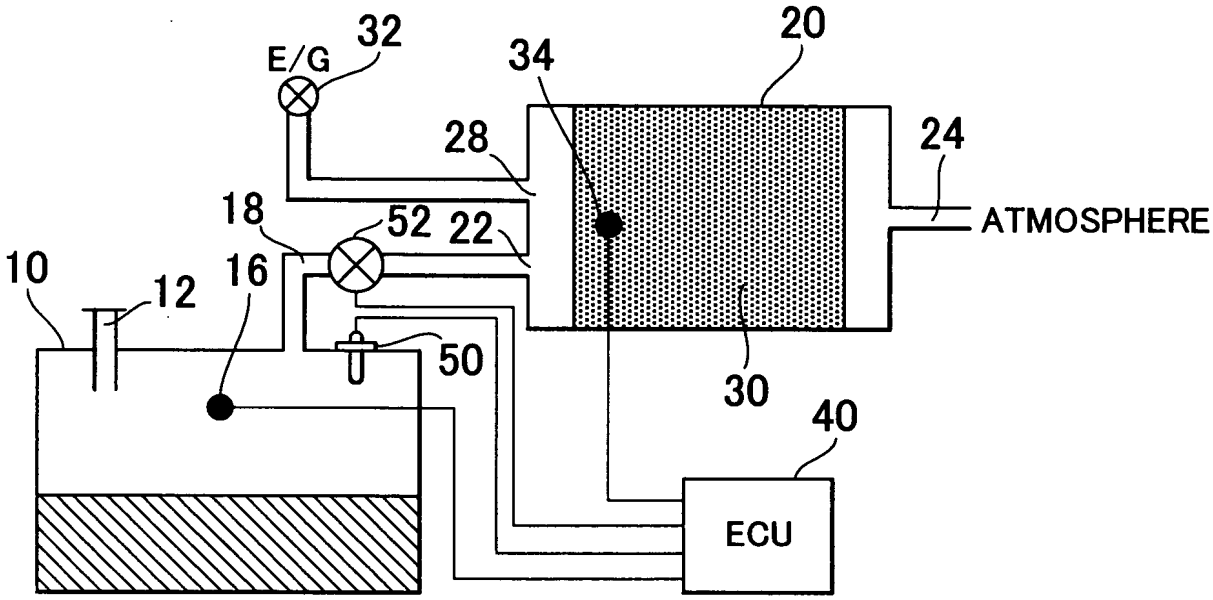


FIG. 8

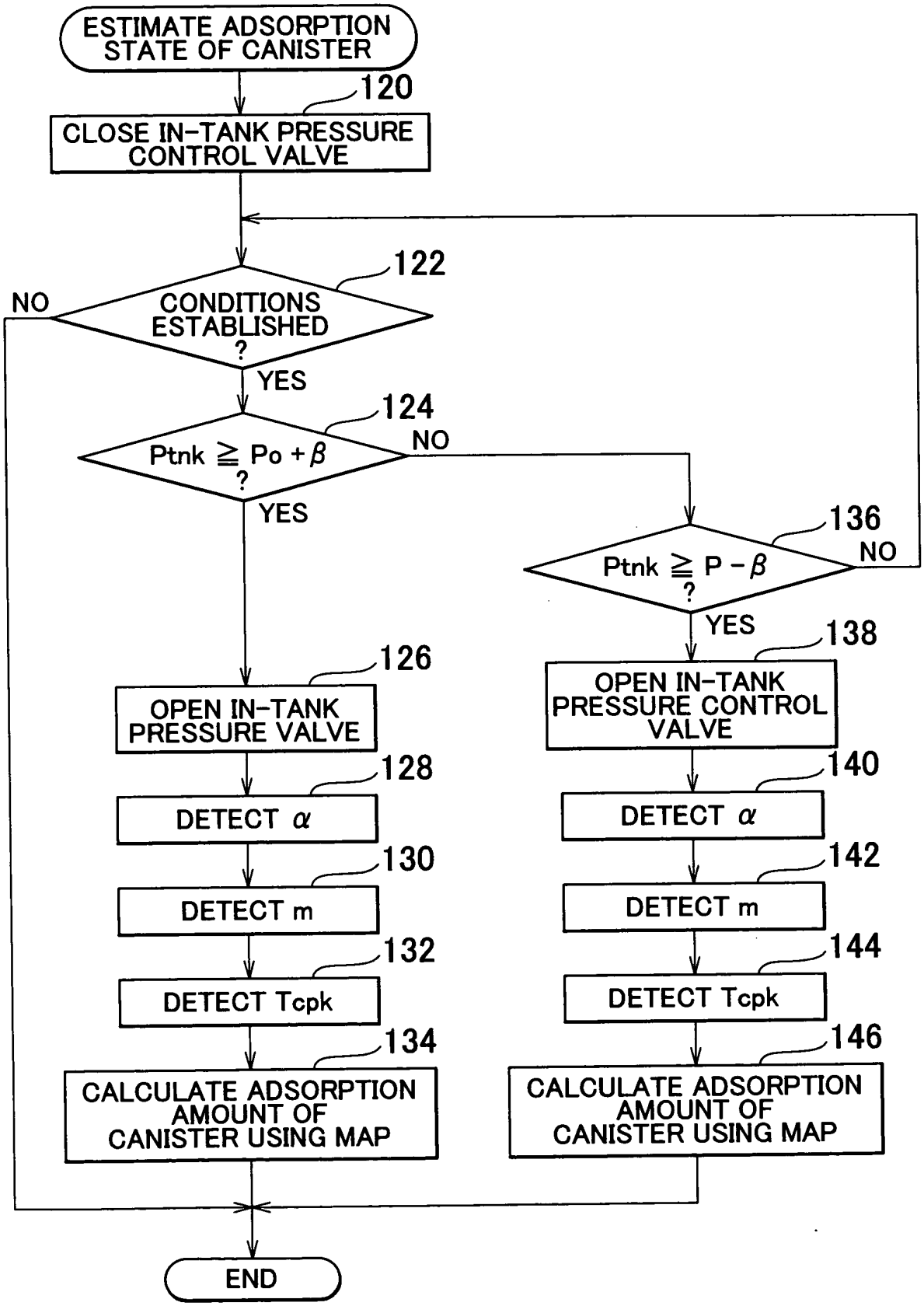

ESTIMATE ADSORPTION STATE OF CANISTER
120
CLOSE IN-TANK PRESSURE CONTROL VALVE
122
CONDITIONS ESTABLISHED ?
NO
YES
124
Ptnk ≧ Po + β ?
NO
YES
136
Ptnk ≦ P - β ?
NO
YES
126
OPEN IN-TANK PRESSURE VALVE
128
DETECT α
130
DETECT m
132
DETECT Tcpk
134
CALCULATE ADSORPTION AMOUNT OF CANISTER USING MAP
138
OPEN IN-TANK PRESSURE CONTROL VALVE
140
DETECT α
142
DETECT m
144
DETECT Tcpk
146
CALCULATE ADSORPTION AMOUNT OF CANISTER USING MAP
END

FIG. 9A

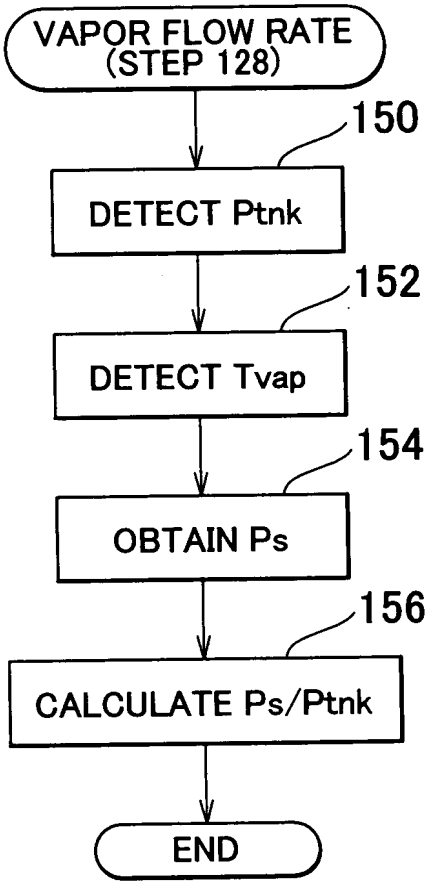

VAPOR FLOW RATE (STEP 128)
150
DETECT Ptnk
152
DETECT Tvap
154
OBTAIN Ps
156
CALCULATE Ps/Ptnk
END

FIG. 9B

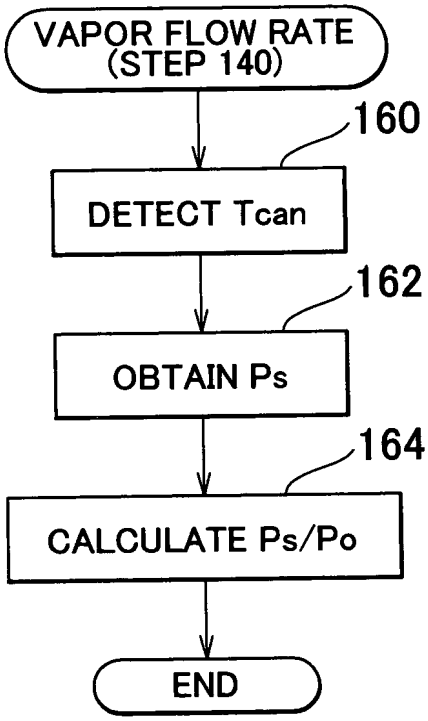

VAPOR FLOW RATE (STEP 140)
160
DETECT Tcan
162
OBTAIN Ps
164
CALCULATE Ps/Po
END

FIG. 10A

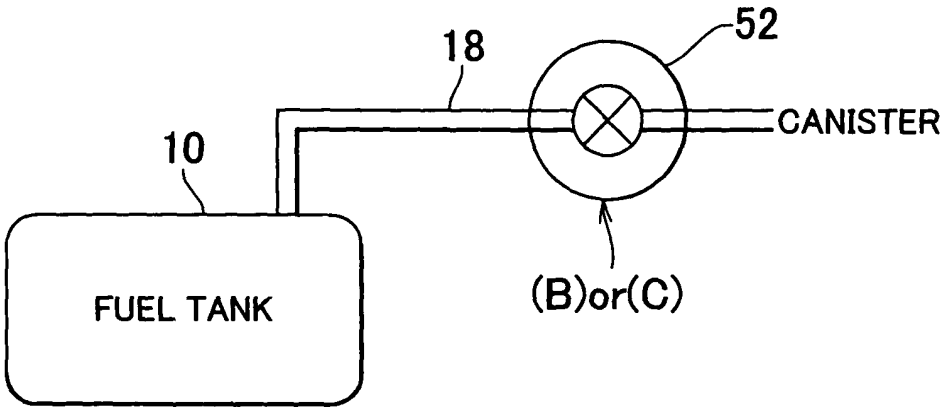
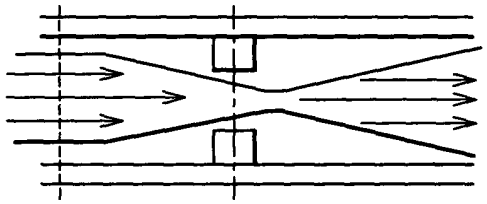


FIG. 10B

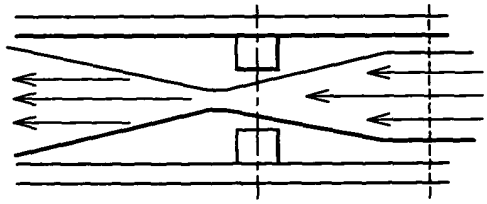


PRESSURE : Pout
TEMPERATURE : Tout
CROSS SECTIONAL AREA : Ao

PRESSURE : Pin
TEMPERATURE : Tin
CROSS SECTIONAL AREA : Aval

FROM TANK TO CANISTER

FIG. 10C



PRESSURE : Pin
TEMPERATURE : Tin
CROSS SECTIONAL AREA : Aval

PRESSURE : Pout
TEMPERATURE : Tout
CROSS SECTIONAL AREA : Ao

FROM CANISTER TO TANK

FIG. 10D

$$m = Cd \frac{Pin}{\sqrt{RTin}} Aval \left(\frac{Pout}{Pin}\right)^{\frac{1}{r}} \sqrt{\frac{2r}{r-1}\left\{1-\left(\frac{Pout}{Pin}\right)^{\frac{r-1}{r}}\right\}}$$

Cd : FLOW RATE COEFFICIENT(COMPRESSIBILTY)
r : RATIO OF SPECIFIC HEAT
R : GAS CONSTANT
m : MASS FLOW RATE
Aval : AREA OF IN-TANK CONTROL VALVE OPENING

FIG. 11A

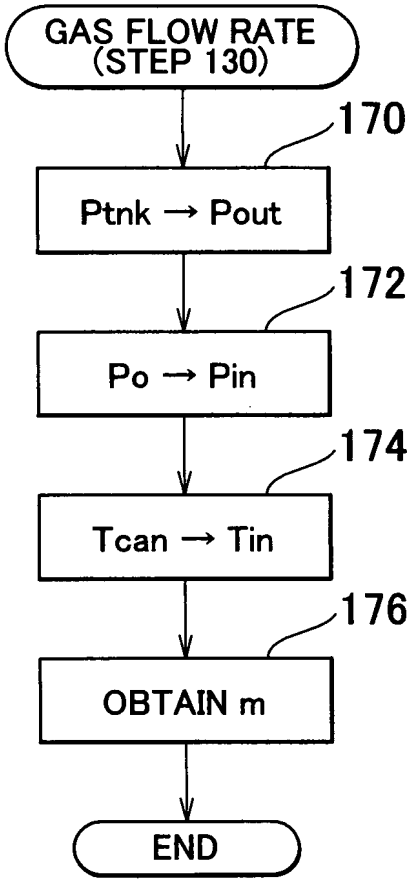


FIG. 11B

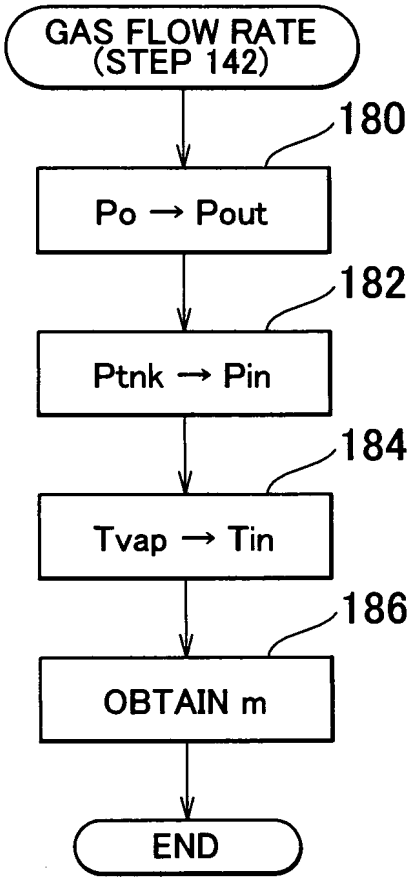


FIG. 12

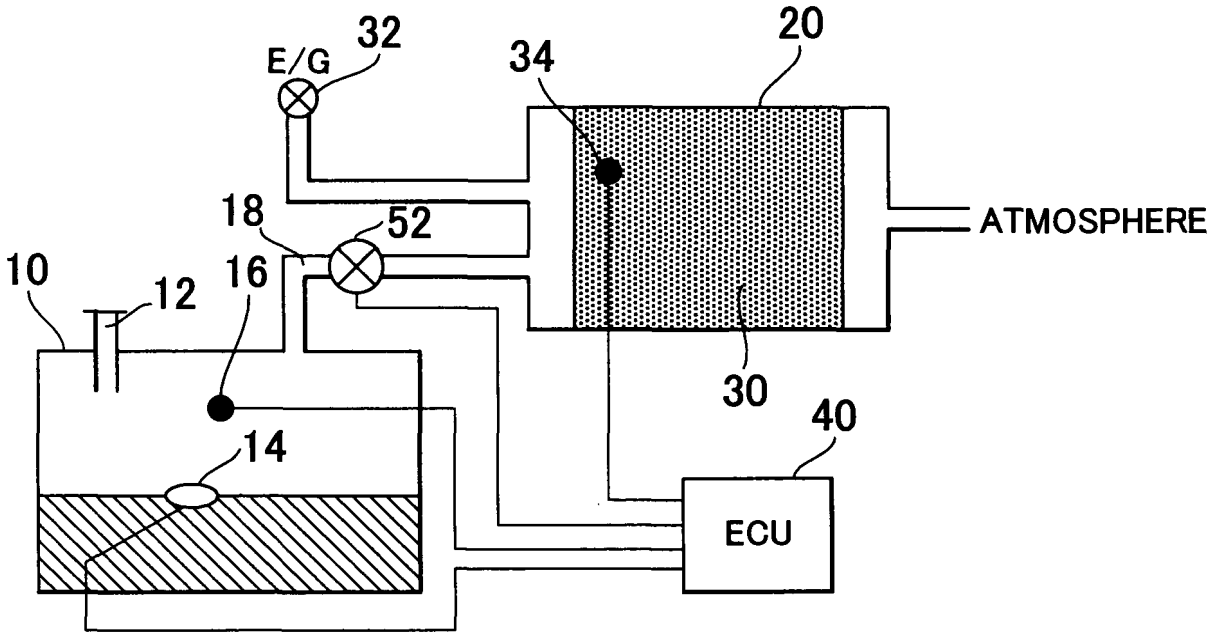
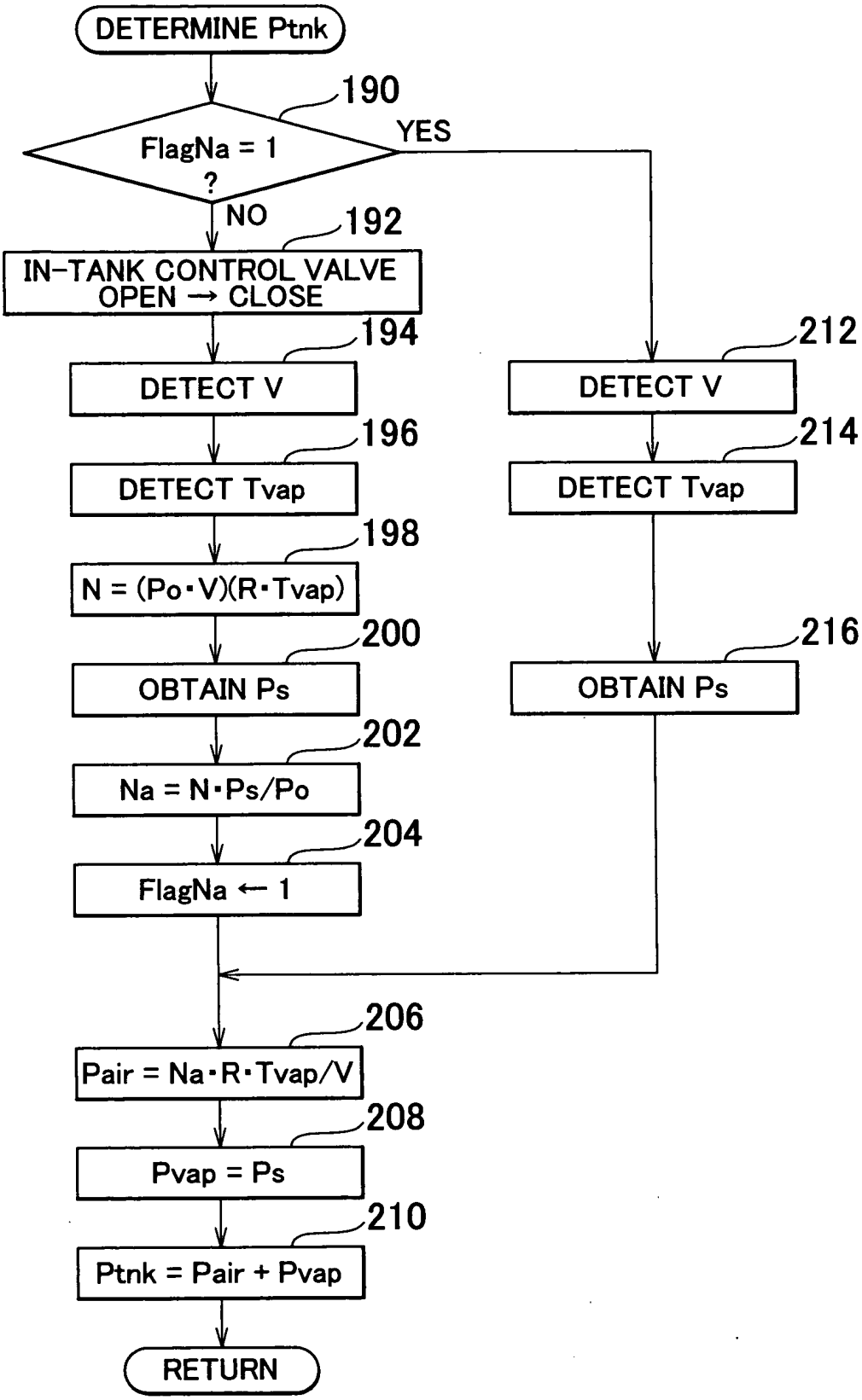


FIG. 13


DETERMINE Ptnk
190
FlagNa = 1 ?
YES
NO
192
IN-TANK CONTROL VALVE OPEN → CLOSE
194
DETECT V
196
DETECT Tvap
198
N = (Po·V)(R·Tvap)
200
OBTAIN Ps
202
Na = N·Ps/Po
204
FlagNa ← 1
212
DETECT V
214
DETECT Tvap
216
OBTAIN Ps
206
Pair = Na·R·Tvap/V
208
Pvap = Ps
210
Ptnk = Pair + Pvap
RETURN